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EXAMINER	
ZHU, BO HUI ALVIN	
ART UNIT	**PAPER NUMBER**
2619	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/670,022	WALSH, HUGH	
	Examiner	Art Unit	
	Bo Hui A. Zhu	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38 and 40-42* is/are rejected.

7)☒ Claim(s) *39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08/06/2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on August 6, 2007 has been entered.

Claims 1 – 42 are pending.

Claims 1 – 38 and 40 - 42 are rejected.

Claim 39 is objected to as being dependant from rejected claims.

The objection to the drawings has been withdrawn in view of the amendment to the drawings.

The objection to the abstract has been withdrawn in view of the amendment to the abstract

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 – 30 and 40 - 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (Fig. 1 - 3; paragraphs [0005] – [0009]) in view of Ren et al. (US 6,456,590).

(1) with regard to claims 1, 9, 10, 13, and 21 - 23:

The admitted prior art discloses a system and method, comprising: n receiver circuits (210A – 210N, on Fig. 2) each for receiving frames of data from a respective

one of n channels (204A – 204N, on Fig. 2; paragraph [0006]); n ingress modules (214A – 214N, on Fig. 2) each comprising a circuit to store the data in one buffer wherein the buffer stores a plurality of bytes of the data (208, on Fig. 2; paragraph [0006]; buffer storing bytes of the data is inherent because each data is a packet and packets are consisted of bytes), and another circuit to select one of the n channels as destination channels for each frames (step 310, on Fig. 3; paragraph [0008]), and a module to enqueue each buffer to the respective destination channels (step 312, on Fig. 3; paragraph [0008]); n egress modules (216A – 216N, on Fig. 2) each for transmitting to one of the n channels the data in the buffer enqueued to the respective one of the n channels (step 314, on Fig. 3).

The admitted prior art does not disclose that n counters each for storing a count for a respective one of the n channels, and to increment the count when an ingress module enqueues a buffer to one of more destination channels, and to decrement the count after the data stored in the buffer is transmitted to one of the respective channels to which the buffer was enqueued; and each egress module exercises flow control on a respective channel when a respective count is greater than a pause threshold.

Ren et al. teaches using a counter to monitor the status of each channel queue and to increment the counter if the channel has received a frame in its queue and decrement the counter is the channel queue has transmitted a frame from its queue (Fig. 5a and 5b; column 9, line 49 – column 10, line 23); and exercising flow control when a counter is greater than a threshold (step 386, on Fig. 6b; column 12, lines 65 – 67; the allocated memory high water mark is the threshold). Such techniques as taught

by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(2) with regard to claims 2, 14 and 24:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose each egress module transmits a pause frame to a respective channel, to exercise flow control.

Ren et al. teaches transmitting a pause message frame (MAC Control message, column 12, lines 41 – 45) to exercise flow control. Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(3) with regard to claims 3, 15 and 25:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose each egress module terminate flow control on a channel when the respective count is less than a pause release threshold.

Ren et al. teaches terminating flow control when the respective count is less than a threshold (steps 392 and 394, on Fig. 6b; column 13, lines 8 – 12; the low water mark

is the threshold). Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(4) with regard to claims 4, 16 and 26:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose each egress module transmits a pause release frame to signal termination of flow control on a channel.

Ren et al. teaches that transmitting a message (MAC control message) to signal termination of flow control (column 12, lines 51 – 56).). Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(5) with regard to claims 5, 17 and 27:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose each counter decrements the count after the data stored in the buffer is transmitted to all of the channels to which the buffer was enqueued.

Ren et al. teaches that each counter decrements the count after the data stored in the buffer is transmitted to all of the channels to which the buffer was enqueued

(column 10, lines 20 – 23). Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(6) with regard to claims 6, 18 and 28:

The admitted prior art discloses all of the subject matter as discussed above and further discloses that n output queues for storing pointers for one or more of the buffers; and the forwarding module sends to the one of the n output queues associated with the one of the destination channels, a pointer for the one of the buffers (step 312, on Fig. 3; paragraph [0009]).

(7) with regard to claims 7, 8, 19, 20, 29 and 30:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose n reserve module each for reserving one or more of the buffers to each channels; and the pause threshold and the pause release threshold for each channel is a function of at least one of the group consisting of the number of the buffers reserved to the channel; and the number of buffers neither reserved nor enqueued to any of the n channel,

Ren et al. teaches reserving part of the memory to each channel (column 10, line 57 – column 11, line 10); and the pause threshold is a function of the number of the buffers reserved to the channel (column 11, lines 42 – 43); the pause release threshold is function of the number of the buffer reserved to the channel (column 11, lines 45 –

column 12, lines 20. This threshold has to be less than the size of the reserved buffered).

(8) with regard to claims 11 and 12:

The admitted prior art discloses all of the subject matter as discussed above and further discloses that a memory comprising the buffers (208, on Fig. 2).

(9) with regard to claim 40:

The admitted prior art does not disclose the pause threshold is based on a number of available pointers.

Ren et al. teaches the pause threshold is based on a number of available pointers (column 11, lines 42 – 43; because the pointers is not clearly defined in the claim, Mi and Di are viewed by the Examiner as pointers). The method as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(10) with regard to claim 41:

The admitted prior art does not disclose the pause threshold is based on a number of pointers in a free module.

Ren et al. teaches the pause threshold is based on a number of pointers in a free module (column 11, lines 42 – 43; because the pointers and the free module are not clearly defined in the claim, Mi and Di are being viewed by the Examiner as pointers

and the hardware module inside the switch that performs the queue algorithm is viewed as the free module). The method as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(11) with regard to claim 42:

The admitted prior art does not disclose the pause threshold is based on a first constant summed with a product of a second constant and number of pointers.

Ren et al. teaches the pause threshold is based on a first constant summed with a product of a second constant and number of pointers (column 11, lines 42 – 43; because the pointers are not clearly defined in the claim, Mi and Di are being viewed by the Examiner as pointers; and because the values of the constants are also not defined, in the case of the first constant being zero and the second constant being one would lead to that the pause threshold is solely based on the pointers). The method as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

4. Claims 31 - 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (Fig. 1 - 3; paragraphs [0005] – [0009]) in view of Ren et al. (US 6,456,590) and further in view of Langberg et al. (US 5,852,630).

(1) with regard to claim 31:

The admitted prior art discloses a system and method, comprising: n receiver circuits (210A – 210N, on Fig. 2) each for receiving frames of data from a respective one of n channels (204A – 204N, on Fig. 2; paragraph [0006]); n ingress modules (214A – 214N, on Fig. 2) each comprising a circuit to store the data in one buffer wherein the buffer stores a plurality of bytes of the data (208, on Fig. 2; paragraph [0006]; buffer storing bytes of the data is inherent because each data is a packet and packets are consisted of bytes), and another circuit to select one of the n channels as destination channels for each frames (step 310, on Fig. 3; paragraph [0008]), and a module to enqueue each buffer to the respective destination channels (step 312, on Fig. 3; paragraph [0008]); n egress modules (216A – 216N, on Fig. 2) each for transmitting to one of the n channels the data in the buffer enqueued to the respective one of the n channels (step 314, on Fig. 3).

The admitted prior art does not disclose that n counters each for storing a count for a respective one of the n channels, and to increment the count when an ingress module enqueues a buffer to one of more destination channels, and to decrement the count after the data stored in the buffer is transmitted to one of the respective channels to which the buffer was enqueued; and each egress module exercises flow control on a respective channel when a respective count is greater than a pause threshold. The

admitted prior art also does not teach using a computer readable medium coded with a computer program to perform the method as discussed above.

Ren et al. teaches using a counter to monitor the status of each channel queue and to increment the counter if the channel has received a frame in its queue and decrement the counter is the channel queue has transmitted a frame from its queue (Fig. 5a and 5b; column 9, line 49 – column 10, line 23); and exercising flow control when a counter is greater than a threshold (step 386, on Fig. 6b; column 12, lines 65 – 67; the allocated memory high water mark is the threshold). Such techniques as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

Langberg et al. teaches a method for a transceiver warm start activation procedure can be implemented in software stored in a computer-readable medium. The computer-readable medium is an electronic, magnetic, optical, or other physical device or means that can contain or store a computer program for use by or in connection with a computer-related system or method (column 3, lines 51-65). Using a computer readable medium with program instruction code would be desirable because it would perform the same function of using hardware but offer the advantage of less expense, adaptability and flexibility. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the limitation as taught by

Langberg et al. into the system of the admitted prior art in order to reduce cost and improve the adaptability and flexibility of the logic simulation.

(2) with regard to claim 32:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose each egress module transmits a pause frame to a respective channel, to exercise flow control.

Ren et al. teaches transmitting a pause message frame (MAC Control message, column 12, lines 41 – 45) to exercise flow control. Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(3) with regard to claim 33:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose each egress module terminate flow control on a channel when the respective count is less than a pause release threshold.

Ren et al. teaches terminating flow control when the respective count is less than a threshold (steps 392 and 394, on Fig. 6b; column 13, lines 8 – 12; the low water mark is the threshold). Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the

art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(4) with regard to claim 34:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose each egress module transmits a pause release frame to signal termination of flow control on a channel.

Ren et al. teaches that transmitting a message (MAC control message) to signal termination of flow control (column 12, lines 51 – 56).). Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(5) with regard to claim 35:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose each counter decrements the count after the data stored in the buffer is transmitted to all of the channels to which the buffer was enqueued.

Ren et al. teaches that each counter decrements the count after the data stored in the buffer is transmitted to all of the channels to which the buffer was enqueued (column 10, lines 20 – 23). Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system efficiency. Therefore, it would have been obvious to one of ordinary

skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

(6) with regard to claim 36:

The admitted prior art discloses all of the subject matter as discussed above and further discloses that n output queues for storing pointers for one or more of the buffers; and the forwarding module sends to the one of the n output queues associated with the one of the destination channels, a pointer for the one of the buffers (step 312, on Fig. 3; paragraph [0009]).

(7) with regard to claims 37 and 38:

The admitted prior art discloses all of the subject matter as discussed above but does not disclose n reserve module each for reserving one or more of the buffers to each channels; and the pause threshold and the pause release threshold for each channel is a function of at least one of the group consisting of the number of the buffers reserved to the channel; and the number of buffers neither reserved nor enqueued to any of the n channel,

Ren et al. teaches reserving part of the memory to each channel (column 10, line 57 – column 11, line 10); and the pause threshold is a function of the number of the buffers reserved to the channel (column 11, lines 42 – 43); the pause release threshold is function of the number of the buffer reserved to the channel (column 11, lines 45 – column 12, lines 20. This threshold has to be less than the size of the reserved buffered). Such technique as taught by Ren et al. would be desirable because it would minimize frame loss by preventing data queue from overflowing thus improve system

efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Ren et al. into the system of the admitted prior art so as to improve system efficiency.

Allowable Subject Matter

5. Claim 39 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments filed on August 6, 2007 have been fully considered but they are not persuasive.

Regarding claim 1, Applicant argues that Ren does not teach the claim limitation of having n counters that each store a count for a respective channel and that increment that count when a respective ingress module enqueues a buffer to a destination, and decrement the count after the data stored in a buffer is transmitted to a destination to which the buffer was enqueued. The Examiner respectfully disagrees. Ren clearly teaches such feature in, for example, column 9, line 46 – column 10, line 23. The cited reference recites that "If a frame is detected as arriving at the Ethernet switch 10 on the input port being monitored by the virtual input queue 80, a frame reception, step 220, is triggered where the virtual input queue 80 records the arrival of the frame and increments a predetermine amount in an increment, step 230" and "If a frame which

arrived on the virtual input queue's input port is detected as departing the Ethernet switch 10, a frame departure, step 240, is initiated where the virtual input queue 80 decrements a predetermined amount in a decrement step 250". Clearly, the cited reference can reasonably read on the claim limitation.

Applicant further argues that the AAPA in view of Ren does not teach the claim limitation of each egress module is adapted to exercise flow control on a respective channel when a respective count is greater than a pause threshold. The Examiner respectfully disagrees. Ren clearly disclose such feature in, for example, column 12, lines 65 – 67 and step 386 on Fig. 6b. The allocated memory high water mark is the threshold. The Examiner believes that the AAPA in view of Ren discloses all of the limitations in claim 1.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bo Hui A. Zhu whose telephone number is (571)270-1086. The examiner can normally be reached on Mon-Thur 10am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571)272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BZ
Examiner
October 4, 2007

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